TwitterIDo: What if My Shopping Bag Could Tell My Friends I'm Out Shopping

Elena Nazzi(✉) and Tomas Sokoler

IT University of Copenhagen, Rued Langaards Vej 7,
2300 Copenhagen, Denmark
{elna,sokoler}@itu.dk

Abstract. In this paper, we explore the use of augmented everyday artefacts to make seniors' everyday activities more visible in local communities to strengthen existing face-to-face social interactions or open new ones. We ground the twitterIDo idea in a three-year research project. We involved seniors as co-designers and we explored twitterIDo in a living lab with a community of senior citizens. Through a set of interactive prototypes of augmented everyday artefacts and dedicated displays, we engaged senior co-designers in in-situ enactments and workshops. Experiencing the possibilities of our idea, the seniors envisioned the use of the interactive prototypes to support their collaboration in shopping activities. We reflect on how promoting social interaction by making everyday activities more visible became instrumental to support collaboration, offering the seniors a clear purpose to make their shopping activities more visible.

1 Introduction

Society is increasingly looking at digital technology to guarantee quality of life for a growing older population. Because quality of life is a complex mix of physical, emotional and social aspects [9], research and industry are exploring novel technologies to support communication between seniors, their caregivers, family members and friends. Our research investigates through design explorations a future where artefacts used by the seniors in their everyday activities are augmented with digital technology to be able to communicate the on-going activity to other seniors. Through this communication, the everyday activities are made more visible, thereby strengthening existing possibilities for social interaction in local communities of seniors, or open new ones. We name this approach twitterIDo. What if a senior lady could let her friends know she is out shopping simply by picking up her shopping bag and going shopping? What if her shopping bag could communicate clues on her owner's shopping activity?

People often needs a good excuse to initiate a conversation with acquaintances or strangers in occasional encounters [15]. Moreover, the changes that often characterize senior life affect the quality and quantity of their social interactions. For some seniors, initiating social interactions may become intimidating, thus finding good occasions and good excuses becomes important [10]. Examples

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of such good excuses can come from everyday activities. Let's think about shopping: noticing someone with bags full of grocery can offer a point for a conversation on the deals in the local supermarket, if not an occasion to help a neighbour to carry home his/her bags. TwitterIDo explores the potential for the design of systems that expand the role of everyday activities as openers of social interaction by making these activities more visible. In particular twitterIDo relies on augmented everyday artefacts to communicate on-going activities and dedicated displays to notice these activities.

This paper presents twitterIDo and our exploration of making the shopping activities of a local community of seniors more visible with twitterIDo technologies. In a living lab [6] comprising over a year of co-design activities, we used a series of interactive prototypes in in-situ enactments, portraying the seniors' own activities, situations and environment. Most interventions looking at seniors' social interaction and well-being focus on strict relations and supporting an emotional idea of caring and keeping an eye on each other [10]. Our findings show that our seniors envisioned twitterIDo as useful to collaborate around shopping activities. Making their shopping activities more visible can have a valuable practical purpose. In this paper, we focus on seniors' everyday activities, artefacts and social networks, and we explore what if social interaction becomes the means that supports a more practical purpose for seniors doing an activity together. We propose a design approach that shifts the attention from caring to supporting everyday activities, and that takes advantage of everyday artefacts to communicate such activities.

2 Related Works

Research in HCI and gerontechnology is increasingly looking at supporting social interaction among seniors, their caregivers and their families [4,8,10,14]. Sociological studies highlight the importance of tickets to talk, or resources, for initiating social interaction in occasional encounters [15]. Svensson and Sokoler [16] design digital technology for social interaction among seniors around TV watching, building on how everyday activities can offer a "resource of information about the state of affairs within a community that may help turn a casual encounter between people into an opening for social interaction [16]. Building on [16] we assume that if activities are more visible, more seniors can notice them, and potentially have additional openings for social interaction.

Mobile devices, smartphones and tables and Internet of Things technologies are increasingly available, making easier and easier to embed technology into our everyday life. It is a question of how to design these technologies to fit the everyday situations of seniors and offer them a concrete benefit in their everyday life. Our work is in line with Brereton's call [3] for designing technology that builds on the habituated artefacts that already are part of a senior's life. The everyday artefacts that seniors use in their everyday activities are the starting point of our designs. Recent research projects are exploring more tangible and situated ways to bring the potential of social networking in the seniors everyday

environments [5]. TwitterIDo stands on the same grounds. Moving away from text interfaces, we explore tangible ways to notice and make everyday activities visible, trying to translate what happens in on-line social networking and make its benefits meaningful for seniors [12].

3 TwitterIDo

The first formulation of twitterIDo emerged during the concept-development phase of the SeniorInteraktion project. This 3-year research project was dedicated to design novel welfare technologies based on reciprocal exchange and social interaction among seniors in local communities. The project was driven by a research-through-design approach and co-design methods, and by a research interest towards tangible and social computing technologies for seniors' everyday life. Investigating the seniors' attitudes towards social interaction technologies through co-design workshops [1,7], we gathered insights that offered the ground for refining twitterIDo and start its exploration. Here a simple scenario:

> Marie is an active 75-years-old woman. She enjoys having walks around the neighbourhood and she shops almost everyday. She often shares shopping favours with other 4 senior neighbours. This morning she takes her shopping-rollator and walks to her local shop. Her augmented shopping-rollator[1] communicates a new shopping update to her shopping group.
>
> Peter is at home having breakfast, when he puts the last portion of milk in his coffee. He will need some milk for his half-morning coffee but he doesn't have time to go to the shop. He is a member of Marie's shopping group. He glances at his tablet display and sees that someone is out shopping. He picks it up and notices that Marie is out shopping. Peter decides to ask Marie to buy him some milk. Peter takes his mobile device, swipes it over the shopping magnet on the fridge and activates his shopping app. He finds Marie's contact, calls her and asks for milk inviting her over for coffee when back from the shop.
>
> Lise is a neighbour of Marie and Peter. She moved in since two months and she does not know many other residents. Lise goes out for a walk. Passing through the entrance hall she takes a look at the Community Display. There are a couple of new offers on display and she stops to take a look at them. While she is in the entrance hall, Marie enters with her shopping-rollator full of bags of groceries. Lise takes the chance to ask Marie about one of the offers on display and they start a nice conversation.

In this scenario, the augmented shopping-rollator communicates when it is in use, and a family of dedicated displays–the shopping tablet at home, the mobile device and the Community Display in the entrance hall–help the seniors to notice shopping activities. These displays offer a dedicated way to keep in

[1] a 4-wheeled walking aid.

contact with each other in different situations. Simple additional clues on on-going shopping activities are available for the seniors to interpret and act upon or simply to ignore. The augmented rollator and the screens are additional resources to strengthen existing ways of noticing everyday activities and interacting in face-to-face encounters. The augmented everyday artefacts offer familiar tangible interfaces to interact with digital technology, while the family of displays aim to facilitate the access and relevance of activity clues depending on situations, locations and content.

Differentiating between personal and semi-public displays, detailed information is communicated to a trusted and interested audience, while anonymous information are available in common areas of the local community. TwitterIDo supports both the community to get an overview of ongoing activities and small groups of seniors to be connected on the basis of a specific activity. In the scenario, the activity of shopping is useful for Marie and Peter that are part of the same shopping group, but also for Lise even if she is not part of this small group.

TwitterIDo builds on the following assumptions:

1. everyday activities have the potential of creating openers of social interaction in occasional encounters and digital technology can contribute to augment their potential;
2. making these everyday activities more visible, we can expand the potential of everyday activities to offer openings for social interaction;
3. augmenting everyday artefact to communicate on-going activities, we can offer seniors a way to make their activities more visible that is familiar and situated in what they do.The seniors can communicate about what they do by simply doing it and the communication is enhanced by the meaning that the artefacts carry with them [3].
4. we support communication in the local community and in particular we look at smaller activity-based groups of seniors that, within this local community, share an interest and practice on specific activities. Brandt et al. [1] call these gropus"communities of everyday practice", groups of seniors doing a particular everyday activity together.

4 Interactive Prototypes

Throughout the living lab, we designed a set of interactive prototypes of augmented shopping rollators, dedicated displays and their communication infrastructure. The following paragraph introduces the interactive prototypes and their functionalities. We decided to not replicate all the functionalities through the different displays because we aim to tailor the interface and interaction design to the situation of use: the common areas, the home or while on the go and shopping. Finally we designed two types of personal displays, mobile phone and tablet. They are dedicated to a particular activity and meant to strengthen the connection between seniors with their activity group rather than with the larger local community.

Fig. 1. MyShoppyBagRollator in use during an activity of the living lab

MyShoppyBagRollator. MyShoppyBagRollator is a 4-wheeles rollator augmented with sensors and equipped with an nfc-enabled interactive dock (Fig. 1). The augmented rollator is able to communicate when it is in use. Here its functionalities:

1. MyShoppyBagRollator is ON when a senior places his mobile device on the interactive dock. The sensors on the rollator detect when the rollator is in use, and, using the mobile device as gateway, the rollator communicates on-going shopping activity. Each activity cue is notified to the system and available for shopping friends over personal displays (mobile and tablet) and on the Community Display.
2. The augmented rollator is OFF when it is not paired with the mobile device. When OFF, MyShoppyBagRollator is a normal non-augmented rollator, it does not communicate and doesn't offer access to shopping activities of other seniors while on the go. Thus the seniors remain in control of what they disclose and when.

Community Display. The Community Display is a big screen (32 or 40 in.) positioned in the entrance hall of the community building (Fig. 2). Built with a

Fig. 2. The Community Display: main page, during co-design activities and details of the shopping page.

web interface, the Community Display shows on-going and planned activities in the community. Here its functionalities:

1. The main page offers an overview of the on-going activities. It offers a list of the most frequent activities showing the number of seniors/artefacts currently involved in a particular activity. From the main page are available also planned activities and seniors can leave digital comments.
2. Selecting one of the activities, a dedicated page offers more details on the activity. For example, the shopping activity page offers 4 views: how many people are currently out shopping and how many offers have been posted recently; a gallery of offers posted by residents in the last week; a summary of the week activities, and finally a list of supermarkets where people is currently shopping.
3. All the activity information on the Community Displays is anonymous, except the explicit comments created by the seniors. Anonymity supports the seniors' concerns for privacy but still offers insights and cues over on-going activities and events' attendance.

Fig. 3. Details of MyShoppyMobile and while in use

MyShoppyMobile. MyShoppyMobile is a mobile device implemented with an application running on Android phones (Fig. 3). Here its functionalities:

1. When paired with MyShoppyBagRollator, the mobile device turns into MyShoppyMobile, a shopping dedicated mobile device. This shopping device has 5 functionalities: make noticeable shopping activities when paired with the rollator; notice shopping activities and new offers with real-time notifications; make noticeable interesting offers allowing the seniors to take pictures and post offers when at home or on the go; browse pictures of interesting offers posted by their shopping friends; directly contact their shopping friends through voip calls (we used Skype).
2. The shopping application is ON when the device is on the dock of MyShoppyBagRollator, or when swiped over an NFC shopping-tag available as fridge magnet or embedded in the weekly deal magazine.
3. MyShoppyMobile becomes a dedicated device to connect seniors with their activity group. ideally, when coupled with different artefacts, MyShoppyMobile offer access to the specific activity such artefact is related to.

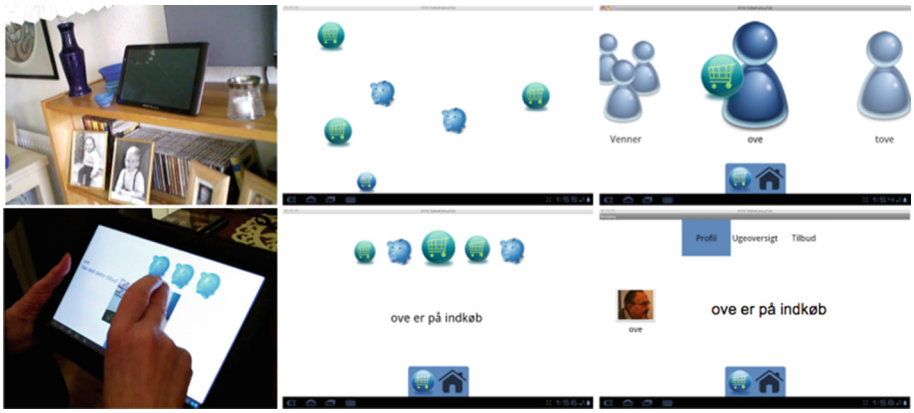

Fig. 4. MyShoppyTab with details from its ideal positioning within the house and screenshots of its interface.

MyShoppyTab. MyShoppyTab is a tablet device implemented with an application running on Android tablets. MyShoppyTab is meant for the home and has two modalities: ambient display and browsing device (Fig. 4). Here its functionalities:

1. When left on the shelf, MyShoppyTab is an ambient display. It shows a glanceable animation collecting real-time notifications of on-going activities within one's own shopping group.
2. When the senior picks up MyShoppyTab or touches the screen, the view reveals details these on-going activities: the latest offers posted and which seniors are currently out shopping.
3. Pressing the dedicated icon, the seniors can enter the browsing mode. In browsing mode, MyShoppyTab offers two functionalities: noticing active members of the shopping group; browsing through the history of activities and offers of the shopping group members and ones' own activities and offers.

5 Method

Our research is based on research-through-design, complemented with a co-design approach. To best investigate the possibilities of twitterIDo, we established a living lab with a community of seniors living in an apartment building in Valby, in the suburbs of Copenhagen. The format of the living lab gave us a vantage point to explore twitterIDo in real life settings and thus best explore its possibilities. The living lab activities lasted over a year from Spring 2011 to Spring 2012. The senior community was composed of 51 seniors living alone or with their spouse, independently in their own apartments. The building, composed of three connected blocks, included common spaces, such as a common dining room and kitchen for common events, a petanque court, a laundry room with a small library, and a leisure room with gym and leisure equipment. The senior residents were quite diverse, ranging from 65 to 98 years old. In general,

the computer literacy of the residents was quite low, and only a few residents had a personal computer and an Internet connection. Although all the seniors had age related issues, we avoided targeting any specific issue, but we considered the needs of the participants as they emerged.

5.1 Procedure

The living lab offered a favourable setting to engage the seniors as co-designers in our exploration. It provided the familiar and known setting necessary for the seniors to relate our ideas to concrete situations in their everyday life. Throughout the living lab, we sketched and used the interactive prototypes to make the concept of twitterIDo concrete for the seniors. These prototypes were iteratively refined and used in in-situ enactments of everyday familiar scenarios and situations. These interactive prototypes and first person enactments were our main tools to start a dialogue with the seniors.

The living lab included over 20 design activities between open workshops and design meetings. The attendance to the open workshops varied from 20 to 7 senior participants, while design meetings involved from 2 to 5 seniors in more focused activities. Overall we aimed to engage the larger possible number of residents, but soon emerged a small group of engaged seniors with whom we decided to conduct focused design meetings in addition to the open workshops.

We can group the twitterIDo explorations in three groups of design activities. First, we introduced the shopping scenario to the larger community to generate discussions in relation to opportunities and to generate the common interest. In this phase, our demonstrations and discussions revolved around a very simple sketch of an augmented rollator able to communicate to the Community Displays when it was in use.

Second, we unfolded the shopping scenario presented earlier in three workshops, one for each of the locations of the seniors (home, shared areas, shop). We conducted the first workshop in a private apartment with 2 seniors; the second workshop in one of the three entrance halls with a group of 11 seniors; and for the third workshop we went to a local supermarket with 3 seniors [11]. In these workshops we discussed concretely the possibilities for noticing and making shopping activities noticeable, engaging the seniors to position tablet devices in their private apartments and imagining their use, discussing the role of the Community Displays for their everyday routines, or trying to post pictures of offers from the shop.

Third, from the insights gathered with the seniors we provided them a set of technologies to try out in first person. Thus we organized a scenario enactment inspired from [2]. We engaged 5 seniors to enact a series of scripted scenes taking place in different locations and following the interactions between the seniors, the technology and their neighbours. In these scenes we let the seniors interact with the technology and with each other with the assistance of researchers and the feedback of other seniors. We asked the seniors to imagine what if they had the technology we designed together and what if they could connect with their shopping group while doing their shopping activities. The researchers motivated

the seniors to reflect on their experience and their practices. The scenes were open to be discussed and re-enacted to fix what was odd and not working for the seniors and thus find better possibilities.

6 Findings

We collected pictures, videos and researchers' notes from informal discussions, activities and observations through the co-design activities. We analysed the data to identify key themes and get insights into how the seniors related their experience of the interactive prototypes with their own ways of shopping and socially interact with their neighbours. Could twitterIDo technologies be a meaningful resource for the seniors and fit with their everyday situations? The data analysis revealed that the seniors envisioned different ways to collaborate over shopping thanks to the additional possibilities to make their shopping activities visible and the additional ways to notice these activities. Our senior participants were very interested in new, everyday and affordable solutions for moving around in the city because the municipality was removing their service-bus. Collaborating and helping each other were their ways to deal with the new situation and they were interested to explore if digital technology could contribute. We report the comments from some of our senior co-designers: Ove (male), Birgit (female), Tove (female), Torben (male) and Åse (female), all in their '70s.

Doing Favours to Each Other. Our senior co-designers offered different examples of their practices of sharing shopping favours with each other. We built our workshops and in-situ enactments on these examples and the seniors took the occasion to relate their engagement with the interactive prototypes of twitterIDo with more examples of their everyday practices. During the early workshops the seniors were concerned about privacy issues and the possible distance that screens and digital communication can introduce between people. But they opened to new possibilities when the seniors started to engage with the interactive prototypes. They started to relate their experiences in our scenarios to their own practices.

Ove and Birgit reported a simple example. Not long before one of our meetings, Ove bought some medicines for Birgit at the pharmacy. The pharmacy is quite far from the residence of our seniors and Birgit has problems with her knees. They interact face-to-face to share their shopping plans sometimes, and when there is a need and an opportunity, they help each other. For both Ove and Birgit knowing when one of their shopping-friends is at the pharmacy is very convenient and can give a chance to ask him/her favours. Ove and Birgit used the pharmacy example as a possible scenario where making the activity more visible can help them find opportunities to do favours to each other, without aiming to replace their face-to-face interactions but being one of the many available resources.

Coordinating Shopping Arrangements. In the scenario enactment, Torben came up with the garden shop example. Torben and his wife own a car that

they use to move around and go shopping. When they go to the garden shop they ask their neighbours if they need anything. The garden shop is far, and some gardening items can be difficult to find in the local shops and carry home. Torben and his wife receive requests before, but also phone-calls while they are at the garden shop. Similarly to the pharmacy example, this example generated reflections among the seniors. Tove convened that twitterIDo-technologies could help Torben and his neighbours with garden shopping: "It might be easier this way" Tove commented. She referred to noticing when Torben is at the garden shop, but also to posting and noticing offers and keep in contact when out and about. As Torben said: "Knowing who is at the shop makes you interact more easily, if you know you need something you can call". In addition to Torben telling his neighbour about his trips to the garden shop, new interactions can happen if his group of garden-lovers could notice when he is at the shop. The seniors imagined a sort of mutual agreement for which if a member of the shopping group is shopping, he/she is also available and open to interact with his/her shopping friends.

Finding Opportunities to Save Money and Spending Time Together. While the examples of the pharmacy and the garden shop are improvised arrangements, the seniors reported also examples of regular shopping arrangements. Åse used to go shopping with one of her neighbours, sharing offers too big for only one person, and exchanging shopping tips. Although not all the other senior participants had similar shopping arrangements, they could easily relate to Åse's example and to the convenience of sharing shopping offers and tips. Ove and Åse offered another example of sharing shopping tips: "Let's take the example of the other day when you [Åse] came with that chocolate, which was on sale for 29 kr., right. Well, I bought four of those. So that piece of information was a good one for sharing". in the scenario enactment, Torben posted a picture of the offer on sausages. It was recognized to be a great offer on sausages "the best you can find, especially for those money" as Åse said. Ove and Torben were particularly interested to see their own pictures and offers on the Community Displays and personal displays. Noticing interesting offers has the practical purpose to help seniors to save money. At the same time, building on personal expertise and interests, posting offers can be engaging for the seniors because they can offer and recognize their own contributions.

As we can expect, what is an interesting offer can be very subjective. During the scenario enactment, Tove and Åse mentioned that they would be more interested in noticing offers on clothes rather than groceries from the Community Displays. Tove explained that: "If somebody is standing there we would also go and check, and start a little conversation maybe" ... "If it is something interesting we can also sit here and talk". Tove added that she could imagine that if two seniors meet in the entrance hall and like the offers on display, they might even decide to go shopping and spend some time together. These reflection point out that cues become valuable occasions for social interaction depending on the people who notices them.

7 Discussions and Conclusions

Our explorations provide insights on the seniors' attitudes towards twitterIDo technology in real-life settings. These insights help us reflect on how communication technology can fit in seniors' everyday life and be meaningful for their everyday practices, as Ostlund [13] advocates. Through our activities it became clear that seniors needed a practical purpose to make their shopping activities more visible through technology. Thus we aimed our activities and interactive prototypes at exploring these practical purposes. The seniors progressively shifted our understanding of twitterIDo technologies. The interactive prototypes became resources for collaborating on shopping activities, and social interaction became the instrument to achieve a better collaboration. The primary motivations for making everyday shopping activities more visible were practical solutions useful for everyday situations.

Previous work has explored communication technology to make everyday activities more visible with family, friends and caregivers [4,10,14]. The attention has often focused on keeping an eye on each other and explicitly creating occasions for social interaction [8,10], [eg.] TwitterIDo provides seniors with technology to collaborate in everyday activities. In line with Svensson and Sokoler's ticket to talk TV [16], in twitterIDo the quest for social interaction is not explicit because the attention is shifted to the activity, to shopping and helping each other shopping. In twitterIDo the focus lies on the activity communicated, on the everyday artefacts that communicate this activity, and last but not least on groups of seniors interested in such activity. Brandt et al. [1] report on how seniors' social interaction often develop around "communities of everyday practice" groups of seniors and neighbours that share an interest or practice in an everyday activity. TwitterIDo supports such everyday networks of seniors rather than focusing on care, friendship or family relations.

Our findings show that twitterIDo offers a valid design approach for supporting social interactions among senior peers in local communities. This design approach proposes to turn the attention to specific activities, moving away from social interaction per-se and further explore how digital technology can support seniors doing activities together, supporting more practical purposes of why seniors would choose to make their activities more visible.Rather than aiming for generalizing our research, we invite other researchers interested in designing for senior social interaction to translate the idea of twitterIDo into their own situations, thus generating new designs that focus on making everyday activities more visible, exploit the everyday artefacts and look at social interaction as an instrument for supporting more practical purposes.

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